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STATUS OF THE LEAST TERN AT CAMP PENDLETON, CALIFORNIA

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INTRODUCTION

The California Least Tern *(Sterna albifrons browni)* is on the Department of the Interior's endangered species list. The survival of this tern is in jeopardy due to intensive urban development of its nesting sites and nearly constant human disturbance during nesting. Except for two remnant colonies, the only natural nesting sites remaining in the state of California are located at the mouth of the Santa Margarita River on Marine Corps Base, Camp Pendleton, in San Diego County (Craig, pers. comm.).

This paper summarizes the results of a study conducted during 1971 and 1972 to determine the status of the Least Tern at Camp Pendleton and to recommend methods of protection and enhancement of the nesting sites.

NESTING SITES

Four nesting areas were used in 1971 and 1972. Two are located on beach sites just north and south of the Santa Margarita River mouth and two are located on a large salt flat, one at the base of a LORAC navigation tower. The nesting areas were therefore designated as the North Beach, South Beach, Salt Flat and LORAC nesting sites.

The North Beach site is 1500 feet x 200 feet and is located between the primary and secondary rows of sand dunes which parallel the beach. In 1971 and 1972 this site was protected by a large barrier and signs indicating the nature of the area.

The South Beach site is also located between the primary and secondary rows of sand dunes, but it is 750 feet x 150 feet. A tracked vehicle route went through it in 1971 before the site was discovered. The area was protected by a fence and signs during 1972.

The Salt Flat and LORAC sites are located on a 40-acre salt flat south of the Santa Margarita River. The Salt Flat nesting site encompasses 12 acres and the LORAC site covers about 2½ acres in the Southwest corner of the salt flats.

The North Beach and Salt Flat sites were active in 1969 (Alan R. Longhurst, pers. comm.), but only the North Beach site was active in 1970 (Craig, 1971). No previous nesting had been documented at the South Beach or LORAC sites.

METHODS

Periodic censuses were conducted in all nesting areas from 15 April until the birds' departure. The counts were made with the aid of 7x50 binoculars or a 20x spotting scope. The number of birds in flight during each census was estimated.

On 3 August 1971, and on 17 August 1972, a final juvenile census was conducted to determine fledgling survival and resultant population recruitment.

An attempt was made to locate and mark all nests. The nests were marked with a coded tongue depressor to identify each one. This procedure was not conducted at the same site on consecutive days or for prolonged periods. Nests that had been located previously were inspected, noting nest structure and lining, number and condition of eggs, evidence of predation and, later, hatching. As the season progressed, nest inspections were combined with locating and marking procedures. The terneries were not entered during temperature extremes, nor did we remain in them for more than a few minutes.

Seine samples were taken to determine fish availability and species composition using a minnow seine in the shallow waters in and near the Santa Margarita Estuary. The fish samples were identified by ichthyologists of the National Marine Fisheries Service, Fishery-Oceanography Center, La Jolla, California.

RESULTS

CENSUS

Longhurst estimated a nesting population of 150 adults in 1969. Stephen B. Smith noted only 38 adults present in 1970 (Craig, 1971). The adult population increased to an estimated 600 in 1971 and then declined to approximately 500 in 1972.

The birds were first sighted in the nesting areas on 29 April 1971 and on 21 April 1972. Upon arrival, the birds gathered at areas of social flocking on the sand spit at the mouth of the Santa Margarita River and on low hummocks in the Salt Flat. The population stabilized at an estimated 600 on 31 May 1971, and at approximately 500 between 20-23 June 1972.

NESTING

The nest of the Least Tern has been described as "a shallow depression in sand or gravel" (Hardy, 1957) and a "small scrape on the ground" (Longhurst, pers. comm.).

On the beach sites all nests were shallow depressions scraped in the sand. Slightly more than one-third of these nests contained sea-shell fragments or bits of wood.

The firmness of the clay silt soils of the Salt Flat precluded any nest building. Instead, many of the birds used some of the thousands of track depressions left by military vehicles. Others nested in old footprints, in tiny rills, in almost imperceptible natural depressions and even on flat ground. Approximately one-third of these nests were lined with small bits of wood.

The size and dispersion of the nesting colonies precluded finding all nests. Therefore, an estimated 10 to 20 per cent of all nesting attempts were not discovered. Examination of the nests showed a decline in 1972 in total nesting attempts, in egg production, in the number of nests in the Salt Flat and North Beach sites (Table 1), and in average clutch size at each nesting site (Table 2). There was, however, an increase in the number of nesting attempts in the LORAC and South Beach sites and an increase in hatching success at every site except the North Beach site.

TABLE 1. Nesting results of California Least Tern, 1971-1972, Camp Pendleton, California

	Salt Flats		LORAC		North Beach		South Beach		TOTALS	
	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972
Nests	201	111	9	20	86	33	40	66	336	230
Eggs Produced	437	203	19	40	191	62	86	114	734	419
Eggs Hatched	189	165	6	36	180	45	71	109	446	335
Hatching Success %	43.5	81.3	31.5	90.4	94.2	72.6	81.6	95.6	60.8	79.9

TABLE 2. Clutch size of California Least Tern, Camp Pendleton, California, 1971-1972.

Clutch Size	Salt Flat		LORAC		North Beach		South Beach	
	1971	1972	1971	1972	1971	1972	1971	1972
1 Egg	28	30	0	6	3	5	1	18
2 Eggs	113	70	8	8	61	27	32	48
3 Eggs	58	11	1	6	22	1	7	0
4 Eggs	1	0	0	0	0	0	0	0
5 Eggs	1	0	0	0	0	0	0	0
Average	2.17	1.83	2.11	2.00	2.22	1.88	2.15	1.72

MORTALITY

Egg Destruction. Thirty-nine eggs were destroyed during the 1971 nesting season and 13 in the 1972 season. The major cause of egg destruction in 1971 was vehicular traffic. Rerouting traffic eliminated that threat. The remaining major threats to the safety of the eggs are gulls and domestic dogs.

Egg Abandonment. On 28 May 1971 a heavy rain shower occurred. The rainfall measured .39 inches at the nearest weather station, 10 miles inland, and was probably heavier at the nesting site. The shower was of short duration and high intensity. The fine soils of the Salt Flat site prevented the water from infiltrating while the track depression nests impounded the water, flooding many eggs. The terns moved these eggs to the highest side of the nests before eventually abandoning them. Rain showers occurred on 19 and 22 May 1972 but measured only .12 and .07 inches, respectively, and egg flooding and abandonment was not common.

Adult Mortality. The remains of three adult least terns in 1971 and one in 1972 were found. All three adults found in 1971 were dismembered, suggesting predation. The lone adult found dead in 1972 appeared to have died from natural causes and was found intact.

Fledgling Mortality. Occasionally chicks were found dead. Without exception the chicks did not exhibit evidence of predation. In most cases parental abandonment, exposure and starvation were thought to be the contributing factors leading to death.

Mortality Rate. The total hatch was 446 eggs in 1971 and 355 eggs in 1972. The juvenile census resulted in a count of 195 birds in 1971 and 92 birds in 1972. These figures indicate a mortality rate of 56 per cent in 1971 and 74 per cent in 1972. The fledgling censuses undoubtedly left some juveniles uncounted. The calculated mortality rate is therefore believed to be higher than the actual mortality rate.

Barrier tripod constructed from old telephone poles to protect North Beach nesting site. A one inch diameter steel cable stretched between 75 of these tripods along three sides of the site effectively prevented vehicular traffic on the site. *Official Marine Corps Photo by Deane K. Swickard*

Vehicle track depression nest and abandoned eggs. Abandonment occurred after heavy rain showers flooded the nest and after the terns had moved the eggs to the highest side of the nest. *Official Marine Corps Photo by Deane K. Swickard*

This five egg Least Tern clutch was completed on 25 May 1971. All eggs were eventually abandoned. Four eggs were found in another nest in the same area. Two of these hatched. *Official Marine Corps Photo by Deane K. Swickard*

Least Tern feeding young at Santa Margarita River Colony, Marine Corps Base, Camp Pendleton, California. *Photo by Randy Crew*

RECRUITMENT

Based on the juvenile census, Camp Pendleton produced a minimum of 195 least terns in 1971 and 92 least terns in 1972. Assuming that only 80 per cent of the nesting attempts were discovered and nesting attempts actually numbered 400 in 1971 and 275 in 1972, the estimated recruitment is calculated to be 233 terns in 1971 and 110 terns in 1972.

AVAILABLE FOOD

Seinings were conducted in the Santa Margarita River estuary three times in 1971 and once in 1972. The seinings produced eight species of fish. Species identified, and length range of those measured, were Anchovy *(Anchoa compressa)* (75-89mm), Top Smelt *(Atherinops affinis)* (12-13mm), Sand Bass *(Paralabrax maculatofasciatus)* (252mm), Flatfish *(Paralicthys californicus)* (175-240mm), Killifish *(Fundulus parvipinnis)* (38-72mm), Least Perch *(Micrometrus minimus)* (86mm), Sculpin *(Leptocottus armatus)*, and Largemouth Bass *(Micropterus salmoides)*. Diamond Turbot *(Hypsopsetta guttulata)*, and Spotfin Croaker *(Roncador stearnsi)* were found during a creel census near the beach nesting sites.

Though the number of each species seined was not recorded, Top Smelt and Killifish were most abundant. Hundreds of each species were collected with every seining in 1971. Each was far less abundant in 1972. Remains of fish representing five species (Top Smelt, Killifish, Anchovy, Sculpin and Least Perch) were found in the nesting sites, probably dropped or discarded by the terns.

DEPARTURE

The terns began to depart in late August and by 13 September 1971, and 17 September 1972, all had departed. The total period of residence was 137 days in 1971 and 149 days in 1972.

CONCLUSIONS

As Massey noted (1971), the California Least Tern needs three conditions to nest successfully: (1) a large expanse of open sand as a nesting area; (2) an estuary adjacent to the ternery with a good supply of small fish; and (3) freedom from disturbance and predation. All three conditions were met on Camp Pendleton.

To increase the productivity of the beach nesting sites, two additional conditions must be met. The vegetation must be removed and the sand within the site must be highly disturbed and displaced. These conditions existed in the North Beach site in 1971 and in the South Beach site in 1972 and each had the highest hatching success for that year.

Removal of the vegetation without sand displacement resulted in a decline in nesting attempts and hatching success. This occurred in 1972 on the North Beach site.

The Salt Flats can best be enhanced by creating additional nest depressions and by depositing sand on the site to improve drainage and camouflage. This will be accomplished in April 1973.

All nesting areas must be afforded as much protection as possible. A fence with large signs indicating the nature of the area has proven adequate on Camp Pendleton.

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BROWN PELICANS IN NORTH-CENTRAL COASTAL CALIFORNIA

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INTRODUCTION

Brown Pelicans *(Pelecanus occidentalis)* have recently been the subject of much concern among biologists, particularly over their disappearance from the Gulf Coast and breeding failures on the West Coast of North America (see reviews in Keith, Woods and Hunt, 1970; Schreiber and Risebrough, 1972). These reports deal primarily with breeding status, but it is important to analyze their status elsewhere during the winter. McCaskie (1970) described the status of this species in the southwestern United States. This paper presents the results of censuses of Brown Pelicans for several years and for several locations on the northern California coast. Interesting parallels become apparent between inland occurrences of pelicans in the southwest and coastal occurrences farther north.

Censuses of wintering pelicans were made almost daily for four years on the Farallon Islands, San Francisco County (37°4'N, 123°W). Censuses of Limantour Estero, on the Point Reyes National Seashore, Marin County (38°N, 123°W) for seven years and those on Bolinas Lagoon (37°4'N, 122°W) 25 km to the south for four of five years were made three to four times each month. Aerial censuses of four estuaries (Abbott's Lagoon, Drake's Estero, Limantour Estero, and Tomales Bay) were made once each month for two years. Except for aerial counts, censuses were done with spotting scopes and binoculars.

RESULTS AND DISCUSSION

Brown Pelicans are winter residents along the northern California coast. In the census years they were present in the Point Reyes-Farallones area mostly from July through December (Tables 1-4). Their arrival and departure in this part of California was one month later than in the Salton Sea area 800 km south based on comparison with McCaskie's (1970) data. Closer proximity to their major breeding colonies in Mexico must account for the different timing of movement in the south. Their arrival in the fall at the Farallon Islands (Table 1) is about a month later than at Point Reyes (Tables 2-4).

This perhaps indicates that the birds move up the coast to the Point and then out to the islands, Point Reyes being the closest land to the Farallones at 32 km. Pelicans leave the Farallones and Point Reyes simultaneously to move south in January.

The Farallon Islands (Table 1) were used much more heavily by wintering Brown Pelicans than were the mainland areas. They roosted primarily on the West End and on Sugarloaf Rock of the Farallones. Although figures presented here are for Southeast Farallon and associated rocks, Pelicans also roosted on the North Farallones 16 km northwest. These rocks, however, are smaller and few pelicans can roost there. On 30 October 1971, for instance, I counted from a boat 375 pelicans covering most of one of the larger rocks. The other two large rocks were occupied mostly by Common Murres *(Uria aalge)* and Pelagic Cormorants *(Phalacrocorax pelagicus)*. Bowman (1961) counted 75 Brown Pelicans at Southeast Farallon in June 1958, but such a large number that early in the year has not since been observed. Although movement probably occurs between Southeast Farallon and the North Farallones, my impression is similar to McCaskie's (1970) for the Salton Sea that the same individuals remained at the islands for long periods.

Brown Pelicans used Bolinas Lagoon (Table 2) more than the other mainland estuaries censused. Limantour Estero was the most heavily used of the estuaries censued on the Point Reyes National Seashore. As the comparison in Table 4 indicates, the pelicans seemed to favor larger or deeper bodies of water. The extent of their movement from estuary to estuary is not known.

Comparison of all census figures shows a decline in numbers over the past several years, although the trend was not absolute. There was a slight revival in numbers during 1971-72 for Limantour Estero and Bolinas Lagoon but there was a decline in the Farallon numbers.

Table 1. Monthly averages of Brown Pelicans at Southeast Farallon Island.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1968–69	0	0	4	4	140	540	1425	105	139	66	0
1969–70	0	2	*	*	*	430	180	94	47	7	4
1970–71	2	2	3	2	272	436	904	307	304	20	1
1971–72	0	1	2	2	159	456	586	265	258	0	0

* No count made

Table 2. Monthly averages of Brown Pelicans at Bolinas Lagoon.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1967–68	0	320	1100	100	*	9	8	0
1968–69	0	0	347	97	84	3	12	3
1969–70	0	0	0	0	0	21	1	1
1970–71	*	*	*	*	*	*	*	*
1971–72	0	150	240	45	107	26	0	0

* No count made

Table 3. Monthly averages of Brown Pelicans at Limantour Estero.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1965–66	0	20	114	182	206	138	4	19
1966–67	0	7	86	6	33	5	4	0
1967–68	0	0	22	18	8	5	1	0
1968–69	0	8	10	1	18	4	0	0
1969–70	0	3	2	6	2	6	0	0
1970–71	3	26	3	*	*	34	23	0
1971–72	0	16	109	*	*	1	0	0

* No count made

Table 4. Numbers of Brown Pelicans counted once each month from an airplane for four tidal bodies of water on the Point Reyes National Seashore: A = Abbott's Lagoon, D = Drake's Estero, L = Limantour Estero, T = Tomales Bay.

		Aug	Sep	Oct	Nov	Dec	Jan	Feb
1968–69	A	0	0	42	50	5	0	0
	D	0	2	150	94	38	0	0
	L	35	0	1	1	0	0	0
	T	125	174	78	94	20	0	0
1969–70	A	0	0	0	0	3	0	0
	D	0	4	5	15	0	0	0
	L	0	35	0	0	0	0	0
	T	36	115	86	80	14	0	44

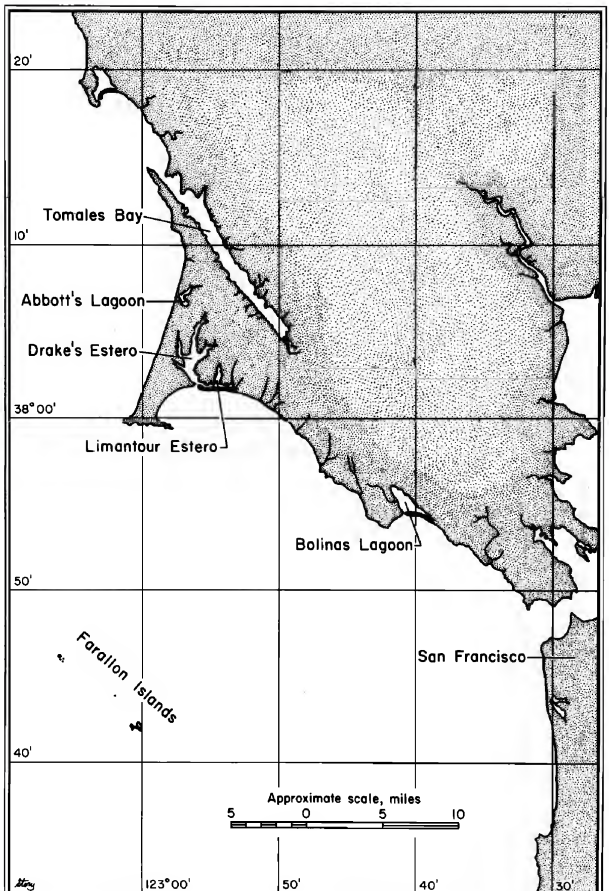

FIGURE 1. The locations on the northern coast of California and the Farallon Islands where censuses of Brown Pelicans were made.

More birds apparently chose to remain near the mainland that year. Reproductive failures at the breeding colonies for the past several years (Schreiber and DeLong, 1969; Schreiber and Risebrough, 1972) probably contributed greatly to the declining numbers reported here for the north coast wintering grounds. The large number of pelicans observed on the Farallones in June 1958 by Bowman (1961) may also indicate greater abundance of the species in earlier years.

The lowest numbers of Brown Pelicans recorded in any of the census years occurred at all locations in the 1969-70 fall-winter. Interestingly, that same fall there occurred the largest influx to that date of pelicans to inland waters in the southwestern United States (McCaskie, 1970). The two events were probably related; pelicans apparently remained in the south during the fall-winter and moved inland rather than northward. In addition, McCaskie wrote of "flight years" when larger than usual numbers of Brown Pelicans and boobies *(Sula leucogaster)* and *(S. nebouxii)* move northward to occur in the Southwest. In 1971, the year of a slight revival in numbers of Brown Pelicans along the northern coast of California (Tables 1-3), pelicans and boobies were very abundant in the Southwest (McCaskie, 1972), and boobies occurred as far north as Pacific Grove, Monterey County – much farther north than they usually move in the winter (DeSante, LeValley and Stallcup, 1972). McCaskie (1970) suggested that fluctuations in food supply were at least partially responsible for year to year differences in winter dispersal patterns. This seems a logical explanation, but there are few reliable data; and other factors such as weather and breeding productivity probably complicate matters.

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FLOATING AND SWIMMING IN PASSERINES

Steven Speich and M. Allen Speich

A recent controversy induced us to submit our observations and experiments on the survival value and mode of swimming by small passerine birds. Scherner (1969) observed a Willow Warbler *(Phylloscopus trochilus)* spreading its wings and tail when floating in water and concluded that the behavior enabled the bird to stay afloat. However, Jackson (1970) questioned whether this behavior was not "... merely part of the swimming movement..." and correctly pointed out that air trapped in the feathers was sufficient to keep a bird afloat without the spreading of the wings and tail. Our observations of floating Cliff Swallows *(Petrochelidon pyrrhonota),* Barn Swallows *(Hirundo rustica),* and House Sparrows *(Passer domesticus)* suggest that even the passive spreading of the wings and tail aids in survival.

There are but a few examples in the literature of passerines using their wings for swimming. In addition to the Dipper *(Cinclus mexicanus)*, which actively uses its wings in swimming under water and occasionally on the surface, the following passerines have been observed surface-swimming: Bank Swallow *(Riparia riparia;* Stoner, 1928 and 1936); Barn Swallow (Jackson, 1970); Catbird *(Dumetella carolinensis;* Petrides, 1942); Robin *(Turdus migratorius;* Broun, 1943); Willow Warbler (Scherner, 1969); House Sparrow (Hickling, 1950; Creutz, 1953); and European Tree Sparrow *(Passer montanus;* Hickling, 1950). Apparently all of the above passerines, possibly excluding the Dipper, employ what is described as the "butterfly" stroke (Jackson, 1970) to propel themselves across the water. This stroke in birds is analogous to the movements of the arms by man in performing the "butterfly."

We now add four more passerine species that swim using the "butterfly" stroke. B. Deuel (pers. comm.) observed in September 1969 at Malheur National Wildlife Refuge, Harney Co., Oregon, a Long-billed Marsh Wren *(Telmatodytes palustris)* that fell into the water. The floating bird immediately swam to shore and climbed onto a bank. The bird was picked up and placed on a branch, where it sat with its feathers fluffed for fifteen minutes before flying away. In July 1965 at the Desert National Wildlife Range, Clark Co., Nevada, Deuel (pers. comm.) saw a Tree Swallow *(Iridoprocne bicolor)* fall into the water while skimming the water surface and

then swim towards shore. On 27 April 1970 we startled a nestling Black Phoebe *(Sayornis nigricans)* in a highway culvert near Clarksville, El Dorado Co., California. It fluttered from its nest and landed six feet from shore in a stagnant pool, where it floated on outstretched wings for thirty seconds before swimming to shore. On approximately 25 occasions betwen 1967 and 1970 we observed individual Cliff Swallows that fell into water during both day and night banding operations at breeding colonies. These mishaps were mainly in concrete culverts beneath highways. The behavior of the adult birds in water varied. During nocturnal banding operations individual adults often floated with spread wings and tail for several minutes until retrieved by banders. However, some birds swam about erratically and then rested for short periods. During the day, downed birds generally tried to swim out of the culvert, using the "butterfly" stroke, to a nearby bank or emergent object. If the water was moving, the downed birds usually drifted passively out of the culvert and then swam to safety.

On the afternoon of 4 July 1970 we examined swallow nests under a wooden bridge near Minden, Douglas Co., Nevada. Irrigation water three to four feet deep in a canal fifteen feet wide flowed under the bridge. Our activities induced five full-sized nestling Barn Swallows to leave their nest prematurely. Four of them fell into the canal and floated 100 feet downstream before disappearing around a bend. The birds in the water arched and rotated their wings slightly forward and spread their flight feathers, holding their heads above water as they floated. At no time were they observed attempting to swim. On the morning of the following day we found that all five young had returned to their original nest; thus their swimming efforts were successful.

At dusk on 4 July 1970 we banded in a Cliff Swallow colony located in a concrete highway culvert in Hope Valley, Alpine Co., California. Nine adult birds accidentally fell into the four-inch-deep rapidly-flowing brook and were carried downstream. The birds hit the water with outstretched wings, and with wings and tail spread were carried through ripples and small falls to a sharp turn. There the birds climbed out onto a sandy bank and onto grass and immediately began preening. Never did they exhibit any detectable wing movements of the "butterfly" type nor loose their buoyant upright position in the water.

In order to study the swimming of passerines more closely, we undertook some simple tests with full grown House Sparrows. When

thrown into water, dry birds immediately swam as described above and were able to fly from the surface almost immediately. However, wetted individuals were unable to do so and swam actively about, resting intermittently on extended wings and tail. A bird that was previously completely soaked was unable to swim nearly as well as the drier birds. In resting, the wings of the soaked bird were only partially extended and hung beneath the surface of the water. With more than half of its trunk below the surface, the bird was unstable, tending to roll from side to side. Immediately after removal from the water, wetted birds were able to fly, but not with normal efficiency. The well-soaked individual could not fly when taken from the water, and it spent more than a half hour preening and drying before it flew.

Downed birds are occasionally taken by aquatic predators. During the summer of 1967 while we were banding Cliff Swallows in a colony near Clarksville, El Dorado Co., California, an adult bird fell into the pool at the colony entrance. The bird immediately swam toward shore but was captured by a Bullfrog *(Rana catesbeiana)* and killed. The Tree Swallow seen swimming by Deuel was also taken by a Bullfrog.

Since passerine birds landing on the surface of the water normally already have their wings open, the observed spread posture of downed birds is expected. The above observations suggest that the spreading of remiges and rectrices is not merely part of the swimming movement and that there is sufficient buoyancy in the feathers of a bird to keep it afloat without spreading. However, spreading reduces the extent of wetting of a downed individual, thus enabling a more rapid escape from the water with concomitantly increased chances of avoiding predation and difficulties in thermoregulation.

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NOTES

NESTLING MORTALITY IN SWALLOWS DUE TO INCLEMENT WEATHER

For two consecutive years 24 hours or more of continuous precipitation during early June resulted in mortality in nestling Tree Swallows *(Iridoprocne bicolor)* and Cliff Swallows *(Petrochelidon pyrrhonota)* in Marin County, California. There have been few reports of swallow nestling mortality caused by inclement weather in North America. Chapman (1955) reported abandoned eggs and death of nestling Tree Swallows at Princeton, Massachusetts in 1940. Paynter (1954) reported Tree Swallow nests with abandoned eggs due to a storm on 8-9 June at Kent Island, Wisconsin. Drury (1959) reported mass nestling mortality due to continuous rain from 12-20 June in Massachusetts.

At Point Reyes Bird Observatory (PRBO) 44 hours of continuous precipitation occurred beginning at 1200 on 8 June 1969. Tree Swallow boxes that I was observing contained 26 nestlings four to twelve days old. Sixteen nestlings were dead by mid-day of 9 June. One brood of five young was still alive but had been abandoned by the parents. Another brood of five was being fed by the male only. All of the nestlings eventually died. None of the banded adults returned the following year. One of them, a female, was found dead 5 miles east of her nest on 9 June 1969.

At a 65-nest Cliff Swallow colony 12 miles east of PRBO dead nestlings were found under some nests and observed dead at the entrances of others. Five of six nests inspected had from 2-5 dead nestlings in various stages of development and one nest contained two live young. Assuming that all 65 nests were active, one of six broods survived, and the average clutch size was 3 (Mayhew, 1958, found the clutch size in central California was 3-4), at least 160 of a possible 195 young may have died at this colony.

The following year (1970) on 8 and 9 June 24 hours of continuous precipitation again caused mortality in nestling swallows. Sixty-six Cliff Swallows were found dead under 178 nests and many more were observed at the entrances of nests at five locations within 12 miles of PRBO. Only one pair of Tree Swallows nested at PRBO in 1970 despite the addition of more nesting boxes. At the time of the rain on 8-9 June incubation had occurred for 11 days in this nest. The eggs never hatched presumably because the female did not incubate them during the storm.

As discussed by Drury (1959) the lack of flying insects during continuous rain makes it difficult for adults to find food. The female Tree Swallow found dead 5 miles from her nest in 1969 was probably miles outside her normal foraging area. She presumably died from hitting a window not from starvation. The adults in their attempt to find food abandoned their nestlings and the predominant cause of death in the young was starvation. This is supported by examination of the stomaches of one brood of four 10-day old nestlings in which I found one nestling with small amounts of food in the esophagus and gizzard, one nestling with food in the esophagus only, and two nestlings with no food in any part of the digestive tract. These nestlings were fully feathered and presumably would not have suffered from the cold if not brooded during

the night. This could have been a contributing factor in the death of nestlings which had sparse body feathering, although night temperatures during the overcast periods in both years was constant around 50 degrees F in constrast to clear nights when the temperature normally dropped to as low as 40-44 degrees F. Minimizing this factor as a contributing cause of death in nestlings are Mayhew's (1958) observations that Cliff Swallow nest temperatures remained constant during the night even though the ambient temperature dropped considerably.

The 100 percent mortality of nestling Tree Swallows during 1969 and 1970 at PRBO and the considerable loss of nestling Cliff Swallows observed within 12 miles of the Observatory represent a small sample of what may have been mass mortality of nestling swallows in central coastal California during the summer of 1969 and 1970. This is Contribution 56 of Point Reyes Bird Observatory.

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A MARIN COUNTY, CALIFORNIA, BREEDING SITE FOR ASHY PETRELS

On 3 July 1972 an Ashy Petrel *(Oceanodroma homochroa)* was found incubating an egg in a rock crevice on Bird Rock, Tomales Point, Marin County, California. In addition, a petrel egg, the size, color and shape of an Ashy Petrel's, was found cracked and deserted in a second crevice. This was donated to the California Academy of Sciences, San Francisco. These discoveries suggest the probable identity of a downy petrel chick found in a rock crevice on Bird Rock on 23 August 1969. At that time it was not possible to determine the chick's identity since two to three week old downy chicks of the probable candidates, Fork-tailed Petrel *(O. furcata)*, Leach's Petrel *(O. leucorhoa)*, and Ashy Petrel, are indistinguishable without the parent present. Based on the number of likely-looking crevices on Bird Rock, and our experience in trying to estimate petrel numbers elsewhere, we estimate the maximum possible breeding population to be 10-12 pairs. The rock is covered by a layer of guano but there was no indication that the petrels excavated burrows into it. The only burrows present were occupied by Pigeon Guillemots *(Cepphus columba)*. Thus, similarly to the Farallon Island population, Ashy Petrels on Bird Rock nest only in natural rock crevices.

The AOU Check-list (p. 23, 1957) reports that Ashy Petrels range north to Point Reyes, Marin County, 27 km south of Bird Rock; and that they breed on four offshore California islands, the closest to Bird Rock being Southeast Farallon Island which is 60 km south. The discovery reported here thus updates that account by extending the range slightly north, by extending the breeding range slightly north, and by bringing to five the number of known breeding localities. The other known breeding islands are much farther from the coast than is Bird Rock, which is about 500 m from the cliffs of Tomales Point. However the rock is well isolated since the channel between it and the mainland is very treacherous and the normal surf conditions make landing on the rock difficult. In the two other accounts of bird life on Bird Rock, Ashy Petrels are not mentioned (Skirm, Ornithol. and Ool. 9: 131-132, 1884; Osborne and Reynolds, Calif. Dept. Fish and Game, Wildl. Manage. Branch Admin. Rep. No. 71-3, 1971).

We thank M. C. Whitt of Inverness for boat transport to Bird Rock. This is Contribution No. 54 of the Point Reyes Bird Observatory. *David G. Ainley, Point Reyes Bird Observatory, Box 321, Bolinas, California 94924; and Timothy Osborne, California State University, Humboldt, Arcata, California 95521.*

RECORDS OF COMMON GALLINULES AT HONEY LAKE, CALIFORNIA

On 23 May 1971 with R. LeValley and T. Manolis, I saw a single Common Gallinule *(Gallinula chloropus)* feeding with American Coots *(Fulica americana)* in shallow water near the headquarters of the Honey Lake Wildlife Area, Lassen Co., California. At the same locality on 24 June 1972, D. Erickson, G. Hunn, R. Stallcup, and I observed the same or another gallinule resting in a diked pond with coots and several species of ducks. The yellow-tipped bill, dark brown back, and white side stripes were noted on each occasion. On neither date was a search made for nests or other gallinules.

There are apparently no other published gallinule records for northeastern California (Grinnell and Miller, Pacific Coast Avifauna, 27: 132, 1944), although the bird checklist of the Klamath Basin National Wildlife Refuges, which includes portions of both California and Oregon, lists the species as accidental. The American Ornithologists' Union (Check-list of North Americans Birds, Fifth Ed., 1957) extends the breeding range north in the western United States to central Arizona and to Glenn and Butte Cos. in the northern part of the Central Valley of California. That publication fails to list the species from any point in the Great Basin, despite the following records: in the Lahontan Valley, Churchill Co., Nevada, an adult specimen was taken on 15 July 1928 (Alcorn, Condor, 42: 169-170, 1940), another bird was collected on 8 October 1940, and one was seen on 29 and 30 August 1942 (Alcorn, Condor, 48: 129-138, 1946); and at Malheur National Wildlife Refuge, Harney Co., Oregon, one was seen on 20 May 1972 (Kingery, American Birds, 26: 787-791, 1972). These occurrences indicate that the Common Gallinule is at least a rare visitor to the Western Great Basin. The summer dates suggest possible breeding status.

I am grateful to Laurence C. Binford for valuable suggestions concerning the manuscript. *Gerald V. Tangren, Department of Zoology, University of Illinois, Urbana, Illinois 61801.*

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